Multiplexed ion beam imaging of human breast tumors.

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Public Summary:
Immunohistochemistry (IHC) is a tool for visualizing protein expression that is employed as part of the diagnostic workup for the majority of solid tissue malignancies. Existing IHC methods use antibodies tagged with fluorophores or enzyme reporters that generate colored pigments. Because these reporters exhibit spectral and spatial overlap when used simultaneously, multiplexed IHC is not routinely used in clinical settings. We have developed a method that uses secondary ion mass spectrometry to image antibodies tagged with isotopically pure elemental metal reporters. Multiplexed ion beam imaging (MIBI) is capable of analyzing up to 100 targets simultaneously over a five-log dynamic range. Here, we used MIBI to analyze formalin-fixed, paraffin-embedded human breast tumor tissue sections stained with ten labels simultaneously. The resulting data suggest that MIBI can provide new insights into disease pathogenesis that will be valuable for basic research, drug discovery and clinical diagnostics.

Scientific Abstract:
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